ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
YEAR A (PHASE A) - LATA DEPLOYMENT

ITEM	YEAR A INITIAL HARDWARE COSTS	YEAR A INITIAL SOFTWARE COSTS	YEAR A RECURRING COSTS
1. What end office, tandem, operator services switch costs (e.g. new LNP trigger, SS7 messaging support, functionality needed to make existing features work properly) are required for this phase?			
2. What, if any, additional SS7 signaling infrastructure (e.g. links, STPs) are required for this phase?			
3. What, if any, additional SCPs are required for this phase (assume 10-digit GTTs in SCPs)?			
4. What, if any, changes are required to the 911 infrastructure?			
5. What is the effect in terms of cost on any impacted OSS (e.g. billing systems, service ordering systems, provisioning systems, maintenance support)? Include cost of carrier owned SMS.			
TOTAL	**$**	**$**	**$**

THIS MATRIX SHOULD BE ITEMIZED ACCORDING TO ASSUMPTION NO. 2 AND ONLY SHARED WITH THE PSC STAFF.

ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
YEAR B (PHASE B) - LATA DEPLOYMENT

ITEM	YEAR B INITIAL HARDWARE COSTS	YEAR B INITIAL SOFTWARE COSTS	YEAR B RECURRING COSTS REFLECTS PHASE A DEPLOYMENT
1. What end office, tandem, operator services switch costs (e.g. new LNP trigger, SS7 messaging support, functionality needed to make existing features work properly) are required for this phase?			
2. What, if any, additional SS7 signaling infrastructure (e.g. links, STPs) are required for this phase?			
3. What, if any, additional SCPs are required for this phase (assume 10-digit GTTs in SCPs)?			
4. What, if any, changes are required to the 911 infrastructure?			
5. What is the effect in terms of cost on any impacted OSS (e.g. billing systems, service ordering systems, provisioning systems, maintenance support)? Include cost of carrier owned SMS.			
TOTAL	**$**	**$**	**$**

THIS MATRIX SHOULD BE ITEMIZED ACCORDING TO ASSUMPTION NO. 2 AND ONLY SHARED WITH THE PSC STAFF.

ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
YEAR C (PHASE C) - LATA DEPLOYMENT

ITEM	YEAR C INITIAL HARDWARE COSTS	YEAR C INITIAL SOFTWARE COSTS	YEAR C RECURRING COSTS REFLECTS PHASES A,B DEPLOYMENT
1. What end office, tandem, operator services switch costs (e.g. new LNP trigger, SS7 messaging support, functionality needed to make existing features work properly) are required for this phase?			
2. What, if any, additional SS7 signaling infrastructure (e.g. links, STPs) are required for this phase?			
3. What, if any, additional SCPs are required for this phase (assume 10-digit GTTs in SCPs)?			
4. What, if any, changes are required to the 911 infrastructure?			
5. What is the effect in terms of cost on any impacted OSS (e.g. billing systems, service ordering systems, provisioning systems, maintenance support)? Include cost of carrier owned SMS.			
TOTAL	**$**	**$**	**$**

THIS MATRIX SHOULD BE ITEMIZED ACCORDING TO ASSUMPTION NO. 2 AND ONLY SHARED WITH THE PSC STAFF.

ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
YEAR D

ITEM	YEAR D INITIAL HARDWARE COSTS	YEAR D INITIAL SOFTWARE COSTS	YEAR D RECURRING COSTS REFLECTS PHASES A,B,C DEPLOYMENT
1. What end office, tandem, operator services switch costs (e.g. new LNP trigger, SS7 messaging support, functionality needed to make existing features work properly) are required for this phase?	NONE	NONE	
2. What, if any, additional SS7 signaling infrastructure (e.g. links, STPs) are required for this phase?	NONE	NONE	
3. What, if any, additional SCPs are required for this phase (assume 10-digit GTTs in SCPs)?	NONE	NONE	
4. What, if any, changes are required to the 911 infrastructure?	NONE	NONE	
5. What is the effect in terms of cost on any impacted OSS (e.g. billing systems, service ordering systems, provisioning systems, maintenance support)? Include cost of carrier owned SMS.	NONE	NONE	
TOTAL	**$ 0**	**$ 0**	**$**

THIS MATRIX SHOULD BE ITEMIZED ACCORDING TO ASSUMPTION NO. 2 AND ONLY SHARED WITH THE PSC STAFF.

ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
YEAR E

ITEM	YEAR E INITIAL HARDWARE COSTS	YEAR E INITIAL SOFTWARE COSTS	YEAR E RECURRING COSTS REFLECTS PHASES A,B,C DEPLOYMENT INSERT SAME AMOUNT AS YEAR D
1. What end office, tandem, operator services switch costs (e.g. new LNP trigger, SS7 messaging support, functionality needed to make existing features work properly) are required for this phase?	**NONE**	**NONE**	
2. What, if any, additional SS7 signaling infrastructure (e.g. links, STPs) are required for this phase?	**NONE**	**NONE**	
3. What, if any, additional SCPs are required for this phase (assume 10-digit GTTs in SCPs)?	**NONE**	**NONE**	
4. What, if any, changes are required to the 911 infrastructure?	**NONE**	**NONE**	
5. What is the effect in terms of cost on any impacted OSS (e.g. billing systems, service ordering systems, provisioning systems, maintenance support)? Include cost of carrier owned SMS.	**NONE**	**NONE**	
TOTAL	**$ 0**	**$ 0**	**$**

THIS MATRIX SHOULD BE ITEMIZED ACCORDING TO ASSUMPTION NO. 2 AND ONLY SHARED WITH THE PSC STAFF.

ECONOMIC ASSESSMENT MATRIX
STATE LOCAL NUMBER PORTABILITY CONSORTIUM
SUMMARY MATRIX

ITEM	TOTAL INITIAL COSTS (SEE NOTE 1)	TOTAL RECURRING COSTS (SEE NOTE 2)	NPV COSTS (SEE NOTE 3)
1. TOTAL NETWORK HARDWARE AND SOFTWARE COST	$	$	NOT NECESSARY
2. TOTAL OPERATIONS SUPPORT SYSTEMS COST	$	$	NOT NECESSARY
3. TOTAL NPAC SMS COST	**TBD BY STAFF**	**TBD BY STAFF**	NOT NECESSARY
TOTAL	$	$	$ **(REQUIRED)**

AVOIDED RCF COSTS	
NETWORK	*$*
OSS	*$*
TOTAL	*$*

THIS MATRIX IS TO BE COMPLETED BY EACH CARRIER. PSC STAFF WILL COMPILE AN AGGREGATE MATRIX TO BE SHARED WITH THE STATE LNP CONSORTIUM.

NOTE 1: THESE COSTS ARE THE SUMMATION OF THE YEAR A THRU E INITIAL HARDWARE AND SOFTWARE COSTS.

NOTE 2: THESE COSTS ARE THE SUMMATION OF THE YEAR A THRU E RECURRING HARDWARE AND SOFTWARE COSTS.

NOTE 3: THIS IS THE NET PRESENT VALUE OF INITIAL AND RECURRING COSTS FOR YEARS A THROUGH E PROPERLY DISCOUNTED TO REFLECT THE YEAR IN WHICH THEY WERE INCURRED. DISCOUNT RATE EQUALS 10%.

Staff's Second Quarterly Report on the Maryland Local Number Portability Consortium

Appendix 9

Appendix 9

APPENDIX 9

Deficiencies of Remote Call Forwarding

Interim Local Number Portability

Local number portability solutions are classified as either "interim" or "permanent." Interim solutions are generally referred to as switch-based solutions. Interim solutions require that calls pass through the company's switch that was initially assigned the number. This means that the carrier losing a customer's business is still in the middle of routing the customer's calls. Examples of interim solutions include remote call forwarding (RCF) and Flex Direct Inward Dialing. Interim solutions have technical drawbacks, introduce routing complexity, network inefficiency and delay and broken enhanced vertical services such as CLASS -- e.g., automatic call back, automatic recall, when directed to a ported number). In older BA-MD switch generics, Caller ID did not function properly with RCF, but this deficiency has been corrected in the newer generic currently available throughout the state. See Figure 1a. Permanent LNP routes calls directly to the new provider's switch and allows competitors to offer advanced services that function correctly. With development, permanent solutions overcome the shortcomings of interim solutions. See Figure 1b.

How Does Permanent LNP Work?

Permanent solutions are generally referred to as database solutions. A model is the 800-number database for routing 800-number calls. Permanent solutions are referred to as "true number portability" because they do not rely on local exchange carriers to forward calls. They involve the use of data-base technologies, Signaling System 7 ("SS7") and Advanced Intelligent Network ("AIN"). SS7 sends information about a call into the network to set up the required connections. AIN allows the call processing to be halted based on defined trigger points. A brief halt can be followed by a database query (or dip). Regional and carrier-owned databases would contain the information about what competitor network serves the called number, and the information necessary to route calls to the ported customer. See Figure 1b.

Databases would determine on a call-by-call basis which competitive network should receive calls destined for the "ported" number. A database would be queried by networks which require call termination. A database would respond to the query with the correct routing information. With this information, an efficient connection path would be established between calling parties.

RCF is illustrated in Figure 1a. Shown is RCF via a direct connection between a BA-MD end office and the end office of the CLEC. The originating caller dials the directory listed 666-1234 number. The customer with this number has changed local service providers from BA-MD to a CLEC, but wants to retain his local telephone number, so his number has been "ported" to the CLEC's network. However, RCF requires that the call must still route to the BA-MD end office which has been assigned the 666 central office code. Upon reaching the BA-MD end office, the BA-MD switch determines that the number has been ported to the CLEC and the call should be forwarded to the trunk group which terminates at central office code 794. Since the 794 central office code is assigned to the CLEC, the BA-MD switch directs the call back to the tandem and then to the CLEC's direct trunk group for completion. The BA-MD switch signals a new called number - 794-1234 - to the CLEC switch. When the call is received at the CLEC end office, it is delivered to the 666-1234 customer. This connection uses SS7 signaling identical to that used by BA-MD today to process calls to other end offices within its own network.

The use of remote call forwarding to accomplish number portability would introduce numerous substantial deficiencies, because BA-MD would remain in the call processing path. These limitations include the following:

1. Potential for Increased Call Blocking and Setup Times
2. Transmission Quality May be Unsuitable for Data
3. CLASS Services May Be Adversely Affected
4. Limitation on Simultaneous Calls
5. Accelerated Exhaust of Available NXX Codes
6. Interexchange Carrier Third Party Billing Problems
7. Limitations on Operator Services
8. Access Charge Misallocation

Each of these limitations is discussed in more detail below.

1. Potential for Increased Call Blocking or Call Setup Times

Since the call must route over an additional trunk group between BA-MD and the Competitive Local Exchange Service Provider, as well as transit the Competitive local Exchange Service Provider's switch itself, the potential for call blocking would increase. The overall blocking probability degradation could be reduced by increasing capacity in the CLEC and LEC switch and trunk groups.

2. Transmission Quality May Be Unsuitable for Data

Another related impact is the potential for transmission degradation. Transmission characteristics may vary depending on the number and type of switches in the call path, the distance and routing necessary to complete the remotely forwarded call. Therefore, the normal grade end-to-end transmission is not guaranteed on such calls. As a result, the CLEC customer could expect to experience a lower quality transmission than they received when they were a BA-MD customer.

BA-MD states, "given that the BA-MD network is predominantly digital (switches and facilities), there is a low risk any services degradation."

It may be true that transmissions entirely within the Bell Atlantic region would produce acceptable results. However, transmissions from poorer quality facilities in other regions could face unacceptable service through RCF. This would not be the fault of BA-MD facilities, just the result of one additional weak link (RCF) in a chain of weak links. When this is the case RCF service may not be suitable for satisfactory transmission of data. Consequently, the CLEC customer would be unlikely to retain their number if they used that number to receive data transmissions. BA-MD customers who receive data transmissions may be reluctant to port their data services if it meant they had to change their phone numbers.

Some data services can potentially by-pass an RCF switch by letting a computer dial the routing number direct to the CLEC switch.

3. CLASS Services May Be Adversely Affected

Today, many end users enjoy the benefits of CLASS features (e.g., Caller-ID, automatic call back, return call, automatic recall or repeat call) provided by BA-MD. RCF causes problems with some of these features for the CLEC and BA-MD customers.

For example, Return Call or Repeat Call would not work properly with RCF if the customer is trying to "repeat to" or return to" a ported number. This effects both incumbent LEC and CLEC customers alike. Repeat Call and Return Call will work properly in other instances.

BA-MD states that in older BA-MD switch generics, Caller-ID did not work properly using RCF. However, this problem has been eliminated in the newer switch generics deployed throughout Maryland. Currently, Caller-ID is not impacted by RCF.

The problem with RCF is number confusion. For most lines, two (but sometimes three for business) numbers may be used: (1) the directory listing number (the number the world knows you by); (2) the routing

number (the number the LEC uses to forward the call to the CLEC; and (3) the billing number (the number recorded in a billing record). These numbers are all needed to properly route, bill and identify a call. Sometimes three separate numbers will be used or alternatively, two of the above numbers will be the same. There are many permutations. CLASS services in different implementations of RCF can always be made to work properly with the three numbers, but different LECs and CLECs may use the numbers differently creating confusion. It should be noted that a different billing number is not a function of RCF. However, RCF can cause problems when the billing number is different, because of "number confusion"

For example, many CLASS features require that the originating caller's identity be forwarded. If the correct information is not forwarded, CLASS features dependent on this parameter will not always work properly. For example, the CLEC's customers' identity may not be denoted by the directory number other customers know them by (e.g., 666-1234) but by the number used by the CLEC switch to route calls to them (e.g., 794-1234).

Under RCF, some features work and some will not work. It is difficult to make all features work for a given ported number in both directions. It would be difficult for engineers to ferret out all the permutations and abnormalities that could occur. A CLEC could not be sure that the service would work properly in all situations. If there is a failure, customers will complain causing bad customer relations, bad press and a degradation to CLEC and incumbent marketability.

Staff's position is as follows. Although not all existing CLASS features are disrupted by RCF and there are some technical ways to make existing CLASS features work properly, RCF could introduce a significant barrier to competition and innovation. Services based on signaling information are complex and will probably become even more complex in the future as customers demand additional functionality and features. Introducing RCF number confusion and a technical weak link into the signaling flow path would slow competition and slow the introduction of innovations that benefit customers.

It is not in the public interest for a CLEC to rely on a competitor LEC to add functionality in the LEC switches so that correct signaling information can be properly transmitted to and from the CLEC. Regardless of the advanced functionality present in BA-MD's switches today, this functionally is not present across the nation, and may not be present in BA-MD's switches in the future. In the future, there may be new features that competitors may want to deploy to gain a competitive advantage.

CLECs may not be able to deploy new CLASS services due to limitations imposed by incumbent RCF switches. This future should be avoided. CLECs should not have to incur costs to try to overcome all these quality problems.

LRN database LNP avoids the RCF problem because it avoids the need for a second routing number (2 - above). With a national LRN standard, the potential for number confusion is eliminated.

4. Limitation on Simultaneous Calls

Some switches may not support the porting of certain customers via RCF. There is a limit to the types of customers that can use RCF. Some switches are programmed to accommodate a limited number of simultaneous calls (e.g., 99 simultaneous calls for each individual directory number). This limitation was developed to prevent the situation where an individual subscriber to call forwarding service could accidentally bring a switch down by forwarding a call to a line which was forwarded back to the original line. This could happen if a customer had call forwarding at both his office and his home, and accidentally had both lines forwarded to the other. In this event, an incoming call to either line would result in an endless loop between the lines. Obviously, there is a need for such a protection.

However, in the case where call forwarding is used for number portability purposes, there is a different impact of this limitation. Where a large customer has one directory number which is used to get to a multi-line hunting or Automatic Call Distributor arrangement, the customer may have need for more than 99 simultaneous calls to a specific number. For example, Sears may publish one "Pilot" number for customers to call, but would have 200 customer service positions behind that pilot number. Sears would not be apt to change local providers if they had to publish one number per 99 operators and then explain to their customers that if the first number is busy, the customer should hang up and call the second one, and so forth.

BA-MD points out that in BA-MD switches, the following are the maximum number of RCF Simultaneous Call Paths for the switch types in the BA-MD network: 1AESS -- 127 per Simulated Facilities Group (SFG), and additional paths can be provisioned by pointing one SFG to another SFG; 5ESS -- 99; DMS100 -- 512.

Staff's position is that it is not in the public interest for a CLEC to rely on the functionality of competitor LEC switches so that proper number of

voice paths are available to accommodate the diverse needs of CLEC customers.

5. Accelerated Exhaust of Available NXX Codes

RCF would accelerate the exhaust of NPAs, because it requires ***two*** numbers to be associated with each customer. The RCF switch reoriginates another (second) call to the CLEC customer. Under RCF, a call to a ported customer uses both the old directory number and the new CLEC routing number. Under permanent database LNP, the new routing number is not needed. This economizes the number of new NPA-NXX codes that need to be assigned to CLECs and thereby conserves numbering resources.

6. Interexchange Carrier Third Party Billing Problems

RCF can cause the potential for problems with interexchange carrier third party billing situations. Because the dialed NXX can no longer be used to identify the service provider for a particular number, there is a potential for problems with interexchange carrier third-party billing. For example, if verification with the 666-1234 number to execute a third party bill request occurred, the billing process could incorrectly cause the interexchange carrier to send the bill to BA-MD for processing, even though the CLEC should receive the bill. Although this problem will not be corrected with the initial deployment of permanent LNP, it is expected that it will eventually have service provider identification information so that billing information is always properly forwarded, whether it be to a facility based carrier or a reseller.

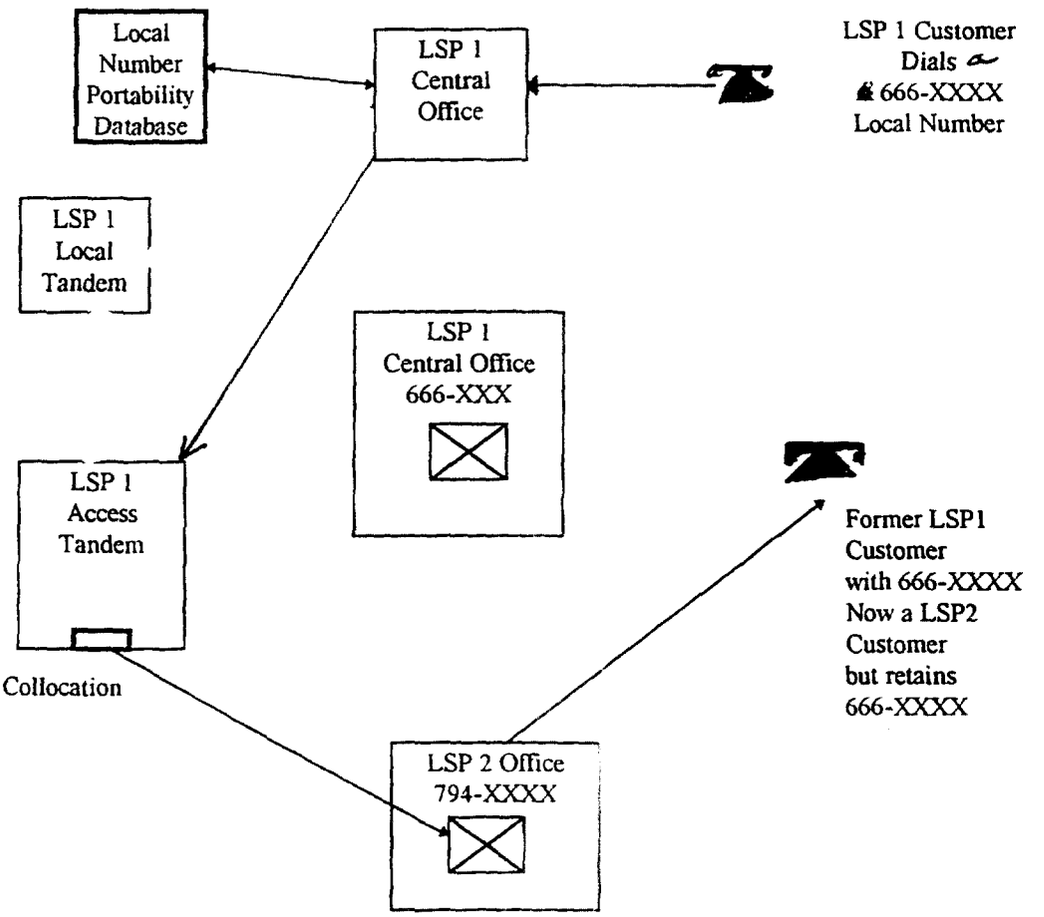
7. Limitations On Operator Services

RCF would also impose significant limitations on Operator Service capabilities. Because the dialed NXX can no longer be used to identify the service provider for a particular number, RCF would limit existing busy-line verification/interrupt service or "barge-in" service. Today, an operator accomplishes this service through connection to the operator services platform associated with the NXX assignment. However, if the ported customer is in the CLEC's network, the BA-MD Operator must do a number conversion using some system to execute the verification and barge-in function. In contrast, permanent LNP can accomplish this simply by using the LRN routing number and no conversion is necessary

8. Access Charge Misallocation

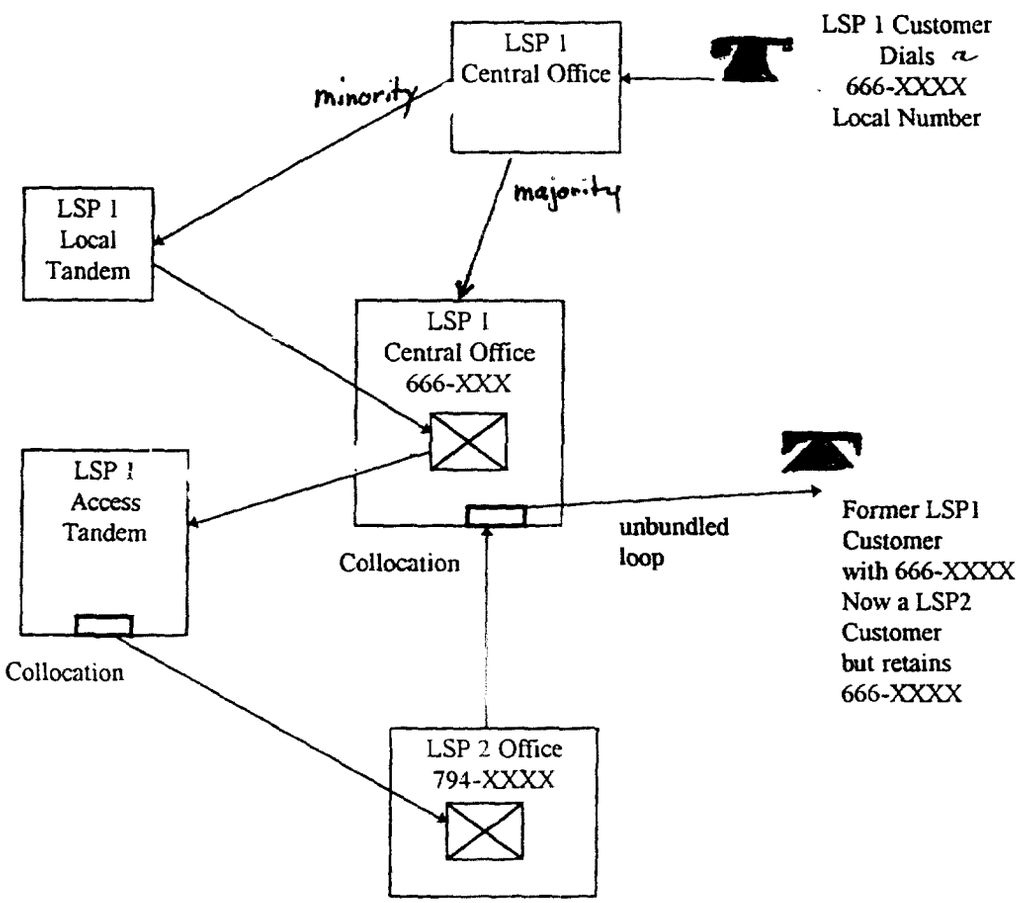
Under RCF, a toll call destined to terminate with a CLEC's end user must first be delivered to the incumbent LEC's end office and be remote call forwarded to the CLEC terminating end office. Under existing Maryland arrangements BA-MD would obtain $.0208 per MOU interstate access charges and remit to the CLEC only $.003 per MOU local termination charge.

Figure 1b.
Database Number Portability
Local Call Routing with Self-Provisioned Loops



port4grp.doc

Figure 1a.
Remote Call Forwarding Number Portability
Local Call Routing with Unbundled Loops



port3grp.doc

Staff's Second Quarterly Report on the Maryland Local Number Portability Consortium

Appendix 10

Appendix 10

Cost of Implementing Number Portability using RCF Approach versus using LRN Approach

MCImetro Estimate of Incumbent LEC Costs in Maryland

prepared by: Stephen Addicks, MCImetro

SUMMARY

This analysis, prepared at the request of the Maryland PSC staff, considers the cost of using RCF to implement service provider number portability. The analysis concludes that the cost of an RCF approach to number portability actually can exceed the cost of an LRN approach, with a crossover point in less than two years, and demonstrates that RCF, with all its technical shortcomings, also is not a particularly low cost approach to implementing number portability.

PLAN DESCRIPTIONS

RCF Alternative - Incumbent uses RCF feature for each DN ported to another network. Each call to these ported DNs routes to incumbent "donor" office and once there is forwarded to the called party's new service provider's network. "Donor" office remains in call path for duration of call.

LRN Alternative - Incumbent queries database on all inter-switch calls to portable NXXs in order to determine appropriate route for calls to ported DNs. A third-party administration system is established to inform all networks of DN moves from one switch to another.

BACKGROUND

Although the RCF approach to number portability requires that any call bound for a ported directory number (DN) must be routed to the switch from which the ported DN originally operated and that this "donor" switch remain in the call path for the duration of each call, only calls actually bound for ported DNs create cost. The RCF plan costs thus reflect the need to include the "donor" switch and related interoffice trunking components on nearly every call to a ported DN. But this cost is incurred only on calls to DNs which are ported, so the RCF plan cost starts low and rises as the portion of traffic bound for ported DNs increases.

On the other hand, with the LRN approach to number portability, any inter-switch call to an NXX defined as portable creates cost, regardless of whether or not the called DN itself is ported. The LRN plan costs thus reflect the need to augment common channel signaling network components, largely to accommodate routing queries for calls to portable NXXs, for all calls to portable NXXs. Since a query is required for any inter-switch call to a portable NXX, regardless of whether or not the called DN is ported, the investment required to handle LNP query load is not directly related to the quantity of customers who have chosen to port their DNs. Because in this analysis all NXXs are assumed portable in the first year, the LRN plan costs occur almost entirely in year 1

METHODOLOGY - ALL PLANS

A typical customer load pattern is developed for high day busy hour attempt rates and average day busy hour voice network occupancy levels. These figures are multiplied by the number of customers involved to develop total loads, then multiplied by unit costs to derive total network costs. No costs are developed for modification of operational support systems (OSS). This is because such costs are believed common to both plans, i.e., OSS modifications are due to competition in general, not just to number portability itself.

A charge of 5% of investment is applied to all study costs (except the third-party ported number administration system charges included in the "LRN high" plan) to represent maintenance costs associated with additional equipment. This charge also is applied to the switch software fees for the LRN features.

Incremental costs only are developed; there is no attempt to recognize equipment breaking points, such as when an STP reaches exhaust and a new device must be added. Also, there is no credit taken for existing spare equipment.

Market penetration assumptions, provided by the Maryland PSC staff, are that 20% of the Maryland market is captured by new LECs over a four-year period but only 3/4 of the new LECs' market share involves customers who port their incumbent LEC DNs.

METHODOLOGY - RCF PLAN

No calls to ported DNs are assumed to require more than one extra switch, such as could occur, for example, on calls from a CLEC bound for a DN ported to that CLEC. This is a "best case" assumption for the RCF plan.

All LECs are assumed to use the same method for number portability. Thus in the RCF plan, all calls to ported numbers are routed to the "donor" switch and then from there forwarded to the ported customer's new local service provider's network for completion. However, all interoffice calls to ported DNs are presumed to involve only one "extra" switch. For example, no charges are added for incoming calls from outside incumbent's network routed via tandem and so involving three "extra" incumbent switches in the call path. This works to understate the RCF plan costs.

Voice network ABS BH (Average Busy Season Busy Hour) load is assumed to run about 3.5 CCS/MS (350 seconds per access line) for customers who migrate to new LECs and retain their DNs. This is slightly above the average customer's load and reflects the assumption that customers who migrate to other local service providers are more "telephone oriented" and so use their telephone service more than the average customer.

The proportion of terminating traffic to customers who change service providers and retain their DNs is assumed to be the same as that for all customers. However, customers who change local service providers and also choose to retain their former DNs probably have a somewhat higher proportion of terminating traffic than does the average customer. This method tends to understate the RCF plan costs.

The incoming call subsequently forwarded at a "donor" office is assumed to have the same impact on that "donor" office as an incoming call to a customer in that office plus an outgoing call from a customer in that office, each having the same duration as the forwarded call. That is, the unit load of a terminating call to a ported number is doubled when calculating the load on the "extra" switch involved in the path of each call to a ported DN. By itself, this method may overstate the RCF plan costs, but is more than compensated for by the conservative terminating load, total load, and single "extra" switch assumptions mentioned above.

METHODOLOGY - LRN PLAN

All NXX codes are presumed portable in the first year. Thus every outgoing, intraLATA call requires a database dip to determine appropriate route. But this in turn presumes that every switch in Maryland would be converted to number portability operation in the first year, a highly unlikely scenario. This is a "worst case" assumption for the LRN plan since it results in having to start out with originating query loads generated by the entire Maryland customer base on the incumbent's network

Switch software for LRN capabilities is priced based on Bell Atlantic statement that switch software for LRN capabilities is estimated by their vendors to cost between $50 and $110 million. Because of this wide range, two LRN plan prices are shown: a "high" plan using the $110 million figure and a "low" plan using the $50 million figure.

To reflect the uncertainty of Bell Atlantic's share of the third-party ported number administration center's cost, the entire $5 million annual charge for the center is included in the "high" LRN plan while no charge for the center is included in the "low" plan.

RESULTS

Costs specific to Bell Atlantic's network are not known to MCImetro. Plan cost development is based on the author's 20 years experience in traffic engineering and related assignments while at Bell Atlantic, and validated against MCImetro expenditures for equivalent network arrangements. The results thus necessarily represent only MCImetro's estimates of the costs which incumbent would incur to implement number portability in Maryland. (MCImetro's estimate of RCF costs is greater than those shown as "RCF avoided costs" in table 1 of staff's report.)

The cumulative network costs encountered in the two plans are summarized in the table below. In the RCF plan, cumulative expenditures represent conventional voice network switch and interoffice trunking costs. In the LRN plan, about $9 million is attributable to common channel signaling network components (links, STPs, SCPs) and the rest to switch LRN software costs. OSS modification costs are presumed common to both plans and are not included. The "LRN (high)" figures also include the entire $5 million annual cost for the third-party ported number administration center. There is a crossover point at which RCF costs exceed LRN costs between 17 months, when 5% of DNs are ported, and 38 months, when 12% of DNs are ported. The analysis results are displayed in graph form on the last page of this report.

Cumulative Investment ($ millions)

	LRN (low)	LRN (high)	RCF
1-1-98	$ 57	$ 117	0
1-1-99	$ 60	$ 128	$ 41
			crossover (low), 5% ported DNs
1-1-00	$ 63	$ 139	$ 89
1-1-01	$ 66	$ 151	$ 143
			crossover (high), 12% ported DNs
1-1-02	$ 70	$ 162	$ 204
1-1-03	$ 73	$ 176	$ 220

SENSITIVITY CONSIDERATIONS

In the RCF plan, the network modeling approach of treating an incoming call handled by the "donor" office using RCF as being the equivalent of an originating call plus a terminating call having the same duration overstates somewhat voice network costs. However, any overstatement of transit costs introduced by this model is likely more than offset by the low incoming and total load assumptions made for the subgroup of end-users who change local service providers and retain their DNs and by the use of a single "extra" switch assumption for all calls to ported DNs. Unit cost for voice network capacity, excluding loop related equipment, is estimated at about $125 per ABS BH CCS. This is not a Bell Atlantic figure, however, and may misstate the RCF plan costs somewhat.

In the LRN plan, common channel signaling network component costs are based on new systems, likely to have better price/performance relationships than the existing older systems used by incumbent. Consequently, MCImetro's estimate of incumbent's common channel signaling network component costs in the LRN plan may be understated by several million dollars.

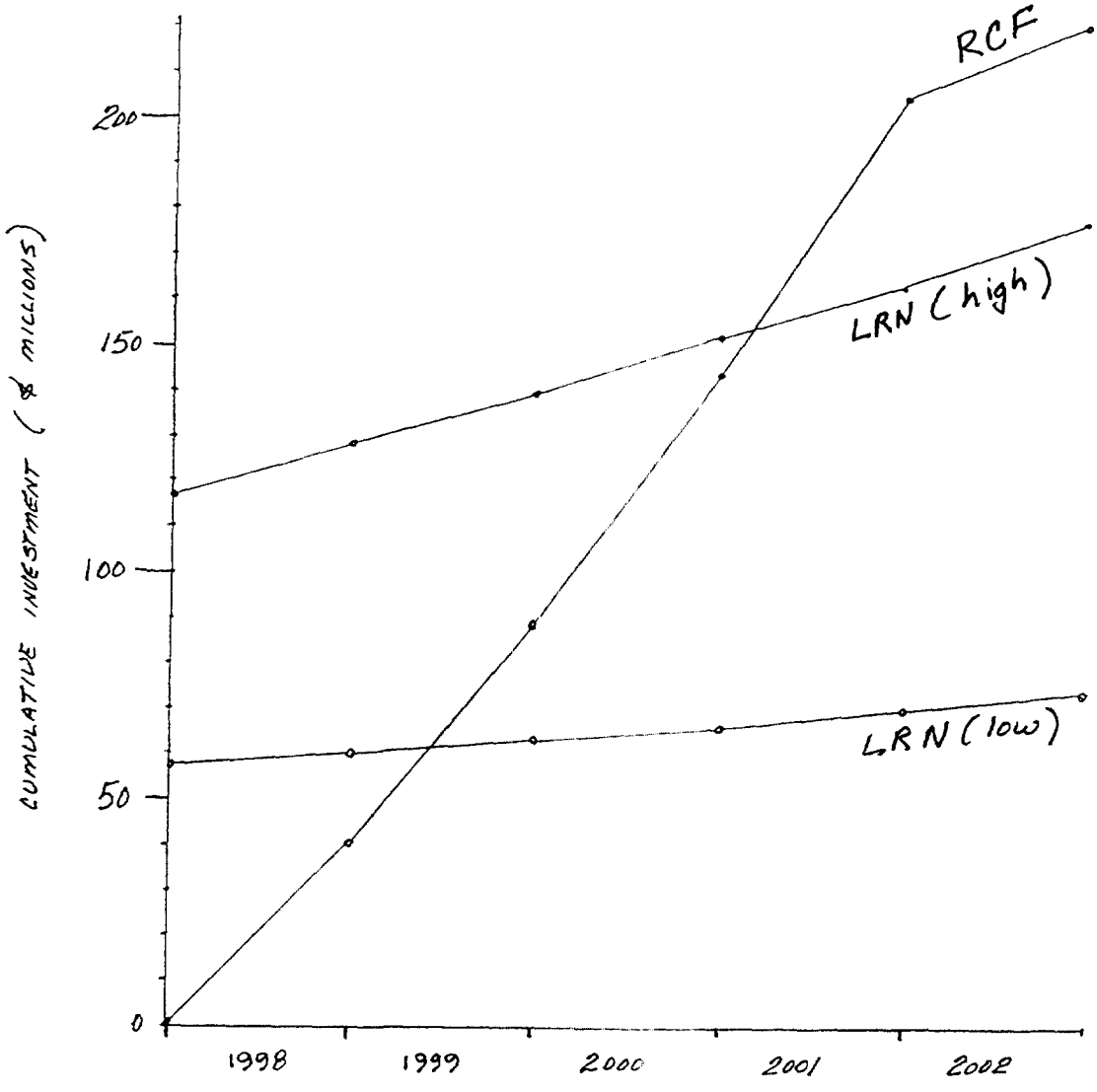
In both plans, no operational support system modification costs are estimated. It is important to differentiate between costs incurred to modify systems to operate in a competitive world and the subset of those costs required explicitly to handle number portability. The analysis assumes OSS modification costs are common to both plans, incurred because of competition in general rather than because of number portability in particular. Even costs which can be attributed specifically to number portability may arise in either plan and thus still may be common to both.

CONCLUSION

The analysis shows a crossover point after about 17 to 38 months when as few as 5% to 12% of incumbent DNs are ported. But it is not important that the crossover point at which RCF becomes more expensive than LRN occurs within a particular time period or at a particular market penetration level. One can very reasonably select values for load, unit cost, and market penetration level different from those used here and change the economic crossover point. What this analysis demonstrates is that RCF, with all its technical failings, also is not a particularly low cost approach to implementing number portability.

Cost of Implementing Number Portability using RCF Approach versus using LRN Approach

MCImetro Estimate of Incumbent LEC Costs in Maryland



March 28, 1996

Mr. Geoffrey Waldau
Maryland LNP Consortium Chairman
Public Service Commission of Maryland
6 St. Paul Centre
Baltimore, MD 21202

Dear Geoff:

At your request at the last MD LNP Steering Committee Meeting, AT&T has reviewed MCI Metro's analysis--Cost of Implementing Number Portability using RCF versus using the LRN Approach, an estimate of costs for the Incumbent LEC in Maryland.

Promod Bhagat, Member of the Technical Staff of AT&T has worked in Network Design, Architecture, and Implementation over the last nine years. He has reviewed the analysis on behalf of AT&T, concurs with the methodology used in the analysis, and agrees with the conclusions. We believe that it is a fair portrayal of Remote Call Forwarding vs. LRN cost estimates.

Don Choate

Staff's Second Quarterly Report on the Maryland Local Number Portability Consortium

Appendix 11

Appendix 11

APPENDIX 11

Permanent Local Number Portability Cost Recovery Framework

All Carriers Must Be Permanent LNP Capable All wireline local exchange carriers must be permanent LNP capable. Non-dip capable carriers or carriers who choose not to dip (CLECs, IXCs, wireless) will be required to pay another carrier (or dip service provider) to perform dips in a manner approved by the Commission, where it has jurisdiction. Carriers who receive undipped calls by default will perform the required dips and should be compensated.

Each Carrier Bears Own Costs Cost recovery must be accomplished in a competitively neutral manner. Each carrier is expected to absorb or recover its own LNP network and OSS costs and contribute to shared costs (e.g., number porting administration center costs). Funds to pay NPAC costs will be assessed based on portable NXX's assigned to each carrier. Rates to recover dip service costs should be determined by the appropriate regulatory authority

LNP Rate Adjustment Carriers would be allowed to include a Local Number Portability (LNP) rate adjustment on their end-user customer bills. Carriers could roll the adjustment amount into current service rates. A carrier would be under no obligation to implement an LNP adjustment for purposes of recovering its LNP investment and expenses. Staff originally proposed a surcharge, but this was opposed by the Consortium.

Fair Share Any adjustment must be levied in a manner approved by the Commission (e.g., price cap plan start-up revenue adjustment, exogenous factor adjustment to be applied to basket 3 or basket 4 services). The Company could choose to credit the adjustment to a customer group (e.g., business customers) at its discretion. However, credited adjustments would be borne solely at shareholder expense and can not be made up by increasing the adjustment on another group (e.g., residential customers). CLECs have indicated that they do not intend to levy adjustments on their customers